Linear Algebra (MATH 3333) Spring 2009 Section 2
Homework 4

Due: Wed. Feb. 18th, start of class

Instructions: Please read the homework policies and guidelines posted on the course webpage. You may **not** use a calculator (or computer). Make sure to write your name, course and section numbers in the top right corner of your solution set, as well as the assignment number on top. Page/section numbers refer to the course text.

Conceptual Questions (not to be turned in)

1. What does matrix multiplication mean in terms of linear transformations?

Written Assignment

Total: 100 points

Note A^2 denotes $A \cdot A$, A^3 denotes $A \cdot A \cdot A$, and so on.

Section 1.3 (p. 31): 11(c)(d)(e), 14(c)(d)(e)(f) (20 points each)

Section 1.4: 8, 10, 11, 34 (10 points each)

Problem A: (20 points) Let S be rotation by $\frac{\pi}{2}$ and and T be rotation by π (counterclockwise, about the origin) in the xy-plane. Write down the matrices for S and T and compute the *average*

$$A = \frac{1}{2}(S + T).$$

Describe what A does geometrically as a linear transformation of $\mathbb{R}^2$. Is this different from what you would expect (i.e., your intuitive notion of what the "average" of these two rotations should be)?